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Abstract : The Mitidja plain area, located in north Algeria, is one of the main agricultural plains in the Mediterranean basin where water supplies are mainly provided by groundwater resource. Due to the effects of a rapid population increase, followed by an intensification of agricultural activities, a proper groundwater vulnerability assessment became urgent. In this study, the DRASTIC model has been utilized to produce a map of groundwater vulnerability for nitrate pollution. To improve the standard DRASTIC vulnerability map, and to offer an innovative and easy tools for water resource protection and water forensics, the rating classes of the DRASTIC model was modified using the real nitrate concentrations analyzed in 44 groundwater sample while sensitivity analysis was used to change the parameter's weights. The validation of the standard DRASTIC model shows a coincidence rate of 67% while the validation of the modified DRASTIC model shows a coincidence rate of 82% (improvement of 15%) with nitrates. The results highlighted two main findings: i) the reliability of modified DRASTIC model, and ii) the dependence of nitrate vulnerability on net recharge, aquifer type, soil texture and topography. The proposed approach demonstrated to be more appropriate in assessing the groundwater vulnerability compared to standard DRASTIC proving to be easy applicable and suitable in any arid and semi-arid region around the world

Key words : Mitidja plain ; Groundwater vulnerability ; Modified DRASTIC ; Geostatistical analysis ; Mapping

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